

Figure 22. Simplified heating loop in plug-flow digester.

Digester temperature

- Mesophilic 100-105 F
- Thermophilic 135 F

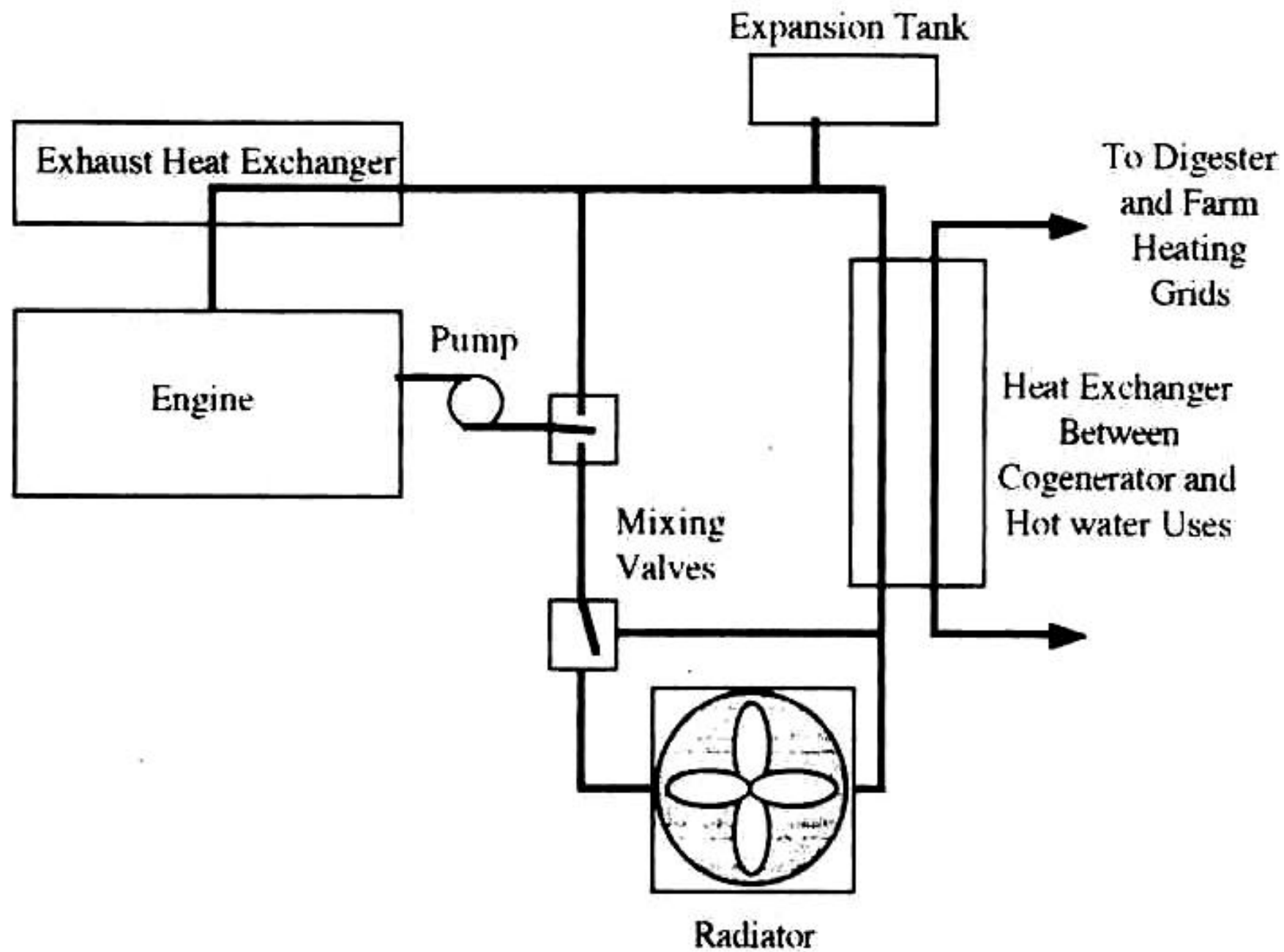


Figure 31. Heat recovery system used by cogenerator.

Value of Recoverable Heat						
	140 kw					
Btu into Generator	1,591,996					
at 30 % efficiency	1,114,397	would be Recoverable				
Manure at 32 degrees	707,472	Btus per hr.				
Heat available for farm	190,000	Btu's per hr.		1.9	Therms	
unrecoverable	216,925			1368	Therms / month	
				\$ 1,778.40	\$ 1.30	
Manure at 75 degrees	200,250					
Heat available for farm	697,222	Btu's per hr		6.97	Therms	
				5018.4	Therms/ month	
				\$ 4,516.56	\$ 0.90	

Power Generation for AD

- Internal Combustion Engines and generators
- Steam turbine generators
- Microturbine generators
- Sterling Engine
- Fuel Cells



STM Power Sterling engine

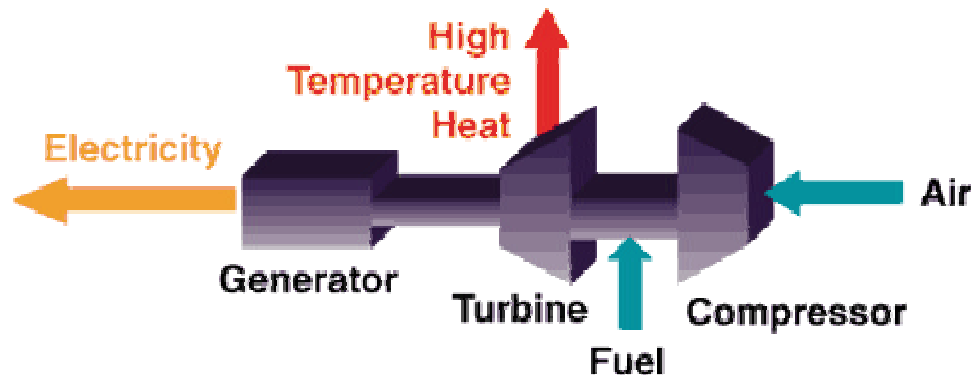


Capstone Turbines



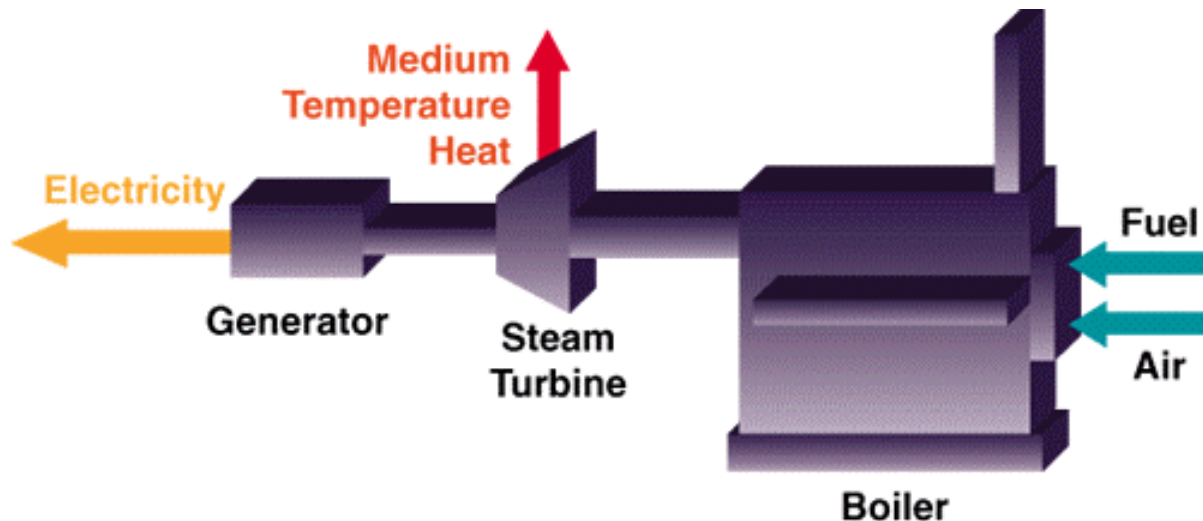
Microturbine Generator

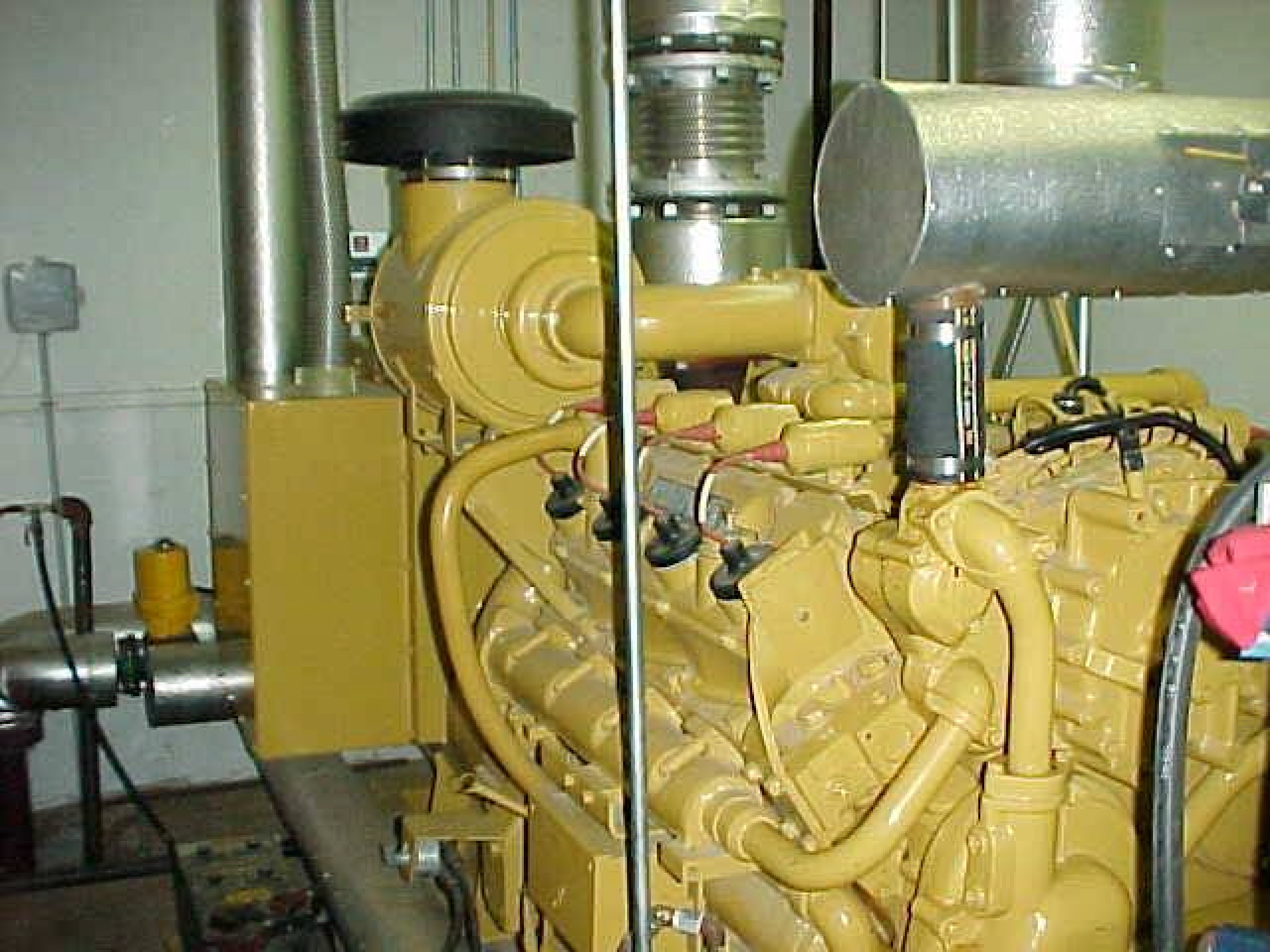
- Small and simply version of large gas turbines
- One moving part
- Excellent heat recovery

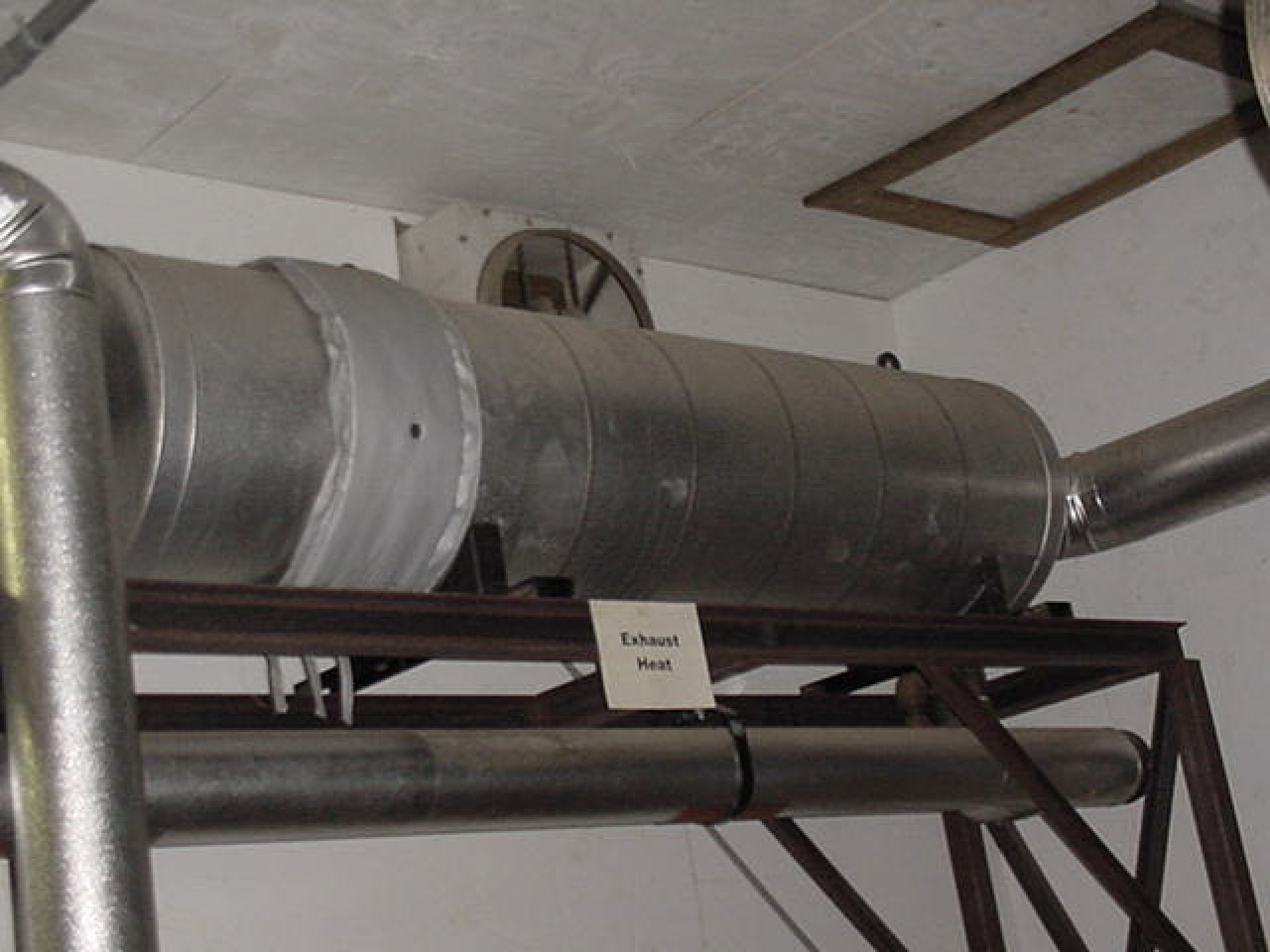


Steam Turbine Generator

- Use methane to heat a boiler
- Steam is used to turn the turbine, which will then create electricity







Exhaust
Heat

Plate Heat
Exchanger





GHD

GHD INC.
WILMINGTON, MA 01897

ANAEROBIC DIGESTERS



























Duane Hanusa

Agriculture Customer Services

Alliant Energy

2777 Columbia Dr.

Portage. WI. 53901

608-742-0888

duanehanusa@alliantenergy.com